

CALIFORNIA DEPARTMENT OF WATER RESOURCES

California Water Plan Update 2018 Plenary



October 9 and 10, 2018

CALIFORNIA DEPARTMENT OF WATER RESOURCES

California Water Plan Update 2018 Plenary

Welcome and Greetings

CALIFORNIA DEPARTMENT OF WATER RESOURCES

California Water Plan Update 2018 Plenary

DWR Director Karla Nemeth

CALIFORNIA DEPARTMENT OF WATER RESOURCES

California Water Plan Update 2018 Plenary

A Day Without Water

CALIFORNIA DEPARTMENT OF WATER RESOURCES

California Water Plan Update 2018

Critical Challenges and Their Root Causes



Paul Massera, P.E.

Water Plan Program Manager

October 9, 2018 | Water Plan Plenary

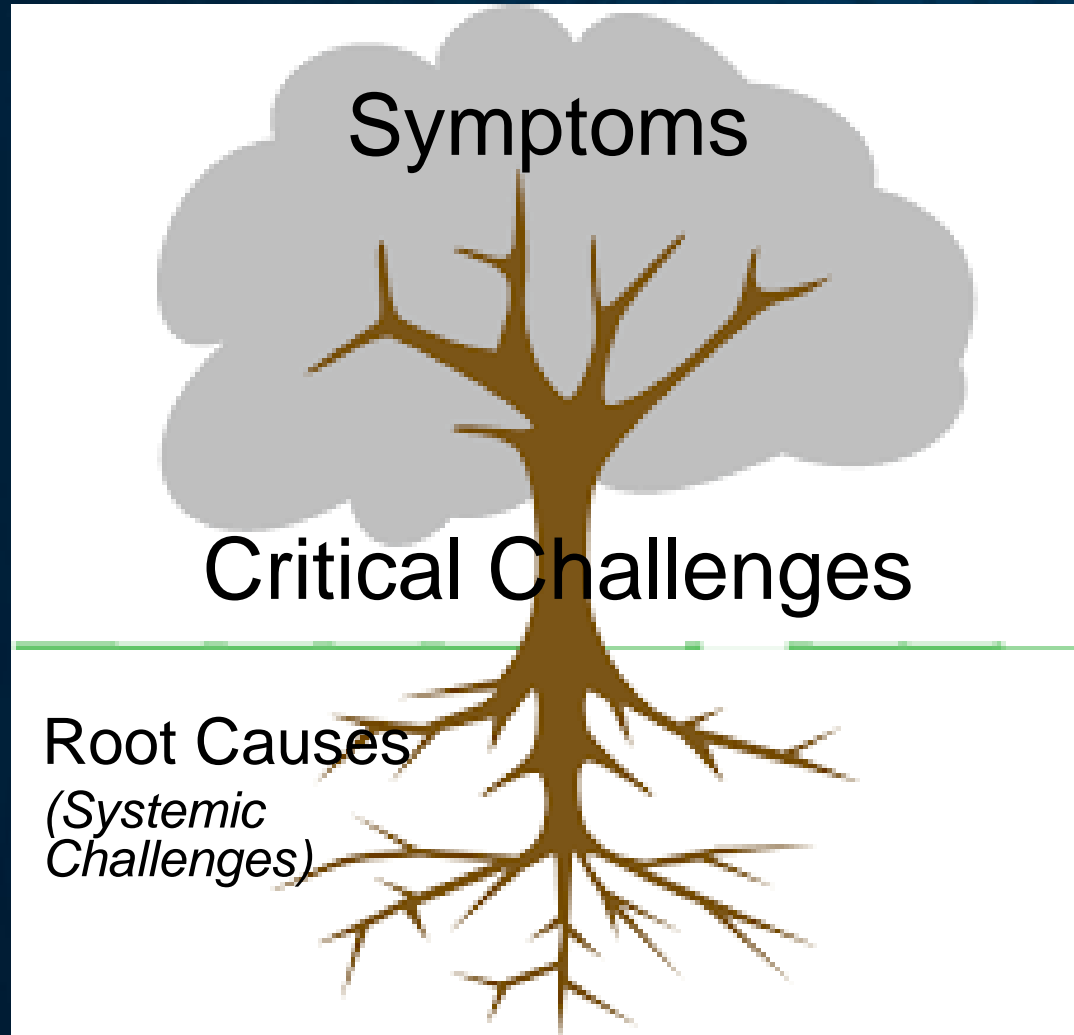
Session Purpose

Describe State water
management challenges that
drove Update 2018
recommendations

First some good news...

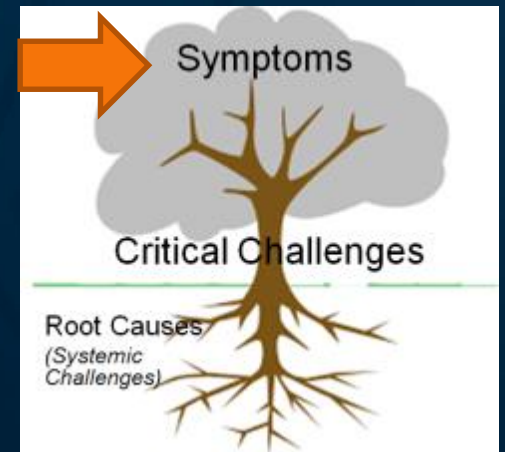
- Many regional and local entities effectively and efficiently serve their constituents.
- Communities that proactively planned and invested have shown considerable resilience.
- Past GO Bond investments have delivered value.
- Significant additional GO Bond authorizations.
- Increased public awareness of CA water.
- SGMA sets stage for GW sustainability.

Framing the Challenges



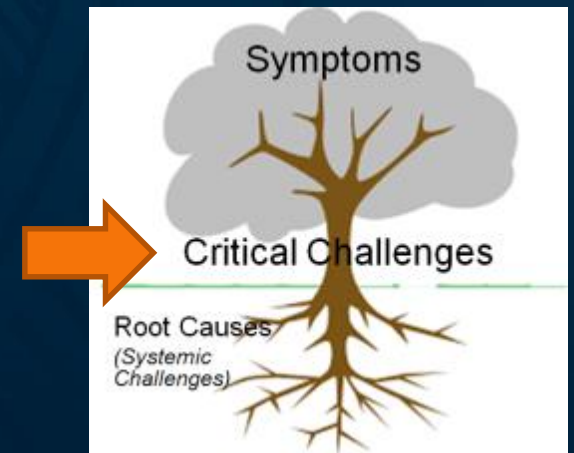
Symptoms

1. Reduced Public Health and Safety
2. Economic Impacts
3. Struggling Ecosystems
4. Reduced Quality of Life



Critical Challenge Categories

1. Aging Infrastructure
2. Climate Change
3. Population
4. Natural Hazards
5. Ecosystem Declines



Critical Challenges

Aging Infrastructure

1. Increasing Flood Risk
2. Reduced Access to Clean, Safe, Reliable, and Affordable Water Supplies
3. Water Quality Degradation
4. Sacramento-San Joaquin Delta Conflicts

Critical Challenges

Climate Change

1. More-Extreme Hydrologic Events
2. Declining Groundwater Levels
3. Declining Forest and Headwaters Health
4. Catastrophic Wildfires
5. Increasing Flood Risk
6. Water Quality Degradation
7. Sacramento-San Joaquin Delta Conflicts

Critical Challenges

Population

1. Changing Demands for Water
2. Increasing Flood Risk
3. Reduced Access to Clean, Safe, Reliable, and Affordable Water Supplies
4. Declining Groundwater Levels
5. Water Quality Degradation

Critical Challenges

Natural Hazards

1. Catastrophic Wildfires
2. Increasing Flood Risk
3. More-Extreme Hydrologic Events
4. Earthquakes

Critical Challenges

Declining Ecosystems

1. Declining Forest and Headwaters Health
2. Declining Groundwater Levels
3. Water Quality Degradation

Critical Challenges

More-Extreme Hydrologic Events

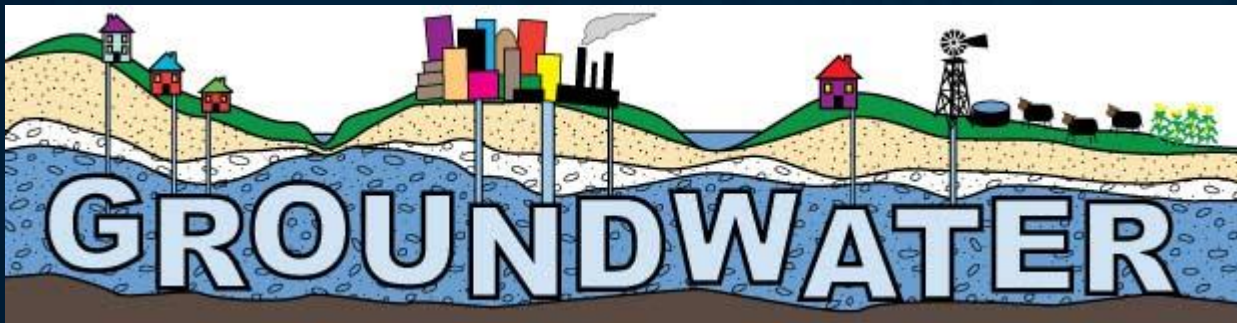
1. Extended Drought (2012 – 2015 driest in 1200 years)
2. Extreme precipitation in 2017 (*wettest winter since early 1980's*)



Critical Challenges

Declining Groundwater Levels

1. GW provides about 30 – 60%% of water supplies.
2. Up to 13 maf of change in GW storage in Central Valley aquifers 2005 – 2010.



Critical Challenges

Increasing Flood Risk

1. Currently:

- 1 in 5 Californians live in a floodplain.
- Nearly \$600 billion in assets at risk.

2. Expectations:

- More precipitation falls as rain than snow.
- More communities are situated in floodplains.
- Maintenance is deferred on existing infrastructure.

Critical Challenges

Declining Forest and Headwaters Health

Headwaters = primary water source for California

1. 129 million dead trees attributed to drought.

2. Affecting forests' capacity to:

1. Naturally regulate streamflow.
2. Buffer water quality.
3. Reduced functioning of wet meadows
4. Perennial streams becoming intermittent
5. Reduction in riparian habitat.



Critical Challenges



Declining Ecosystems

1. Relative to other water sectorsEcosystem restoration has been an investment priority of Californians.
2. The same is true for forest and headwater management.
3. Example: More than 150 species are listed as Threatened or Endangered in California

Critical Challenges

Catastrophic Wildfires



1. 2017:

- A. 46 deaths (not including landside fatalities)
- B. 1,436,558 acres burned
- C. 10,822 structures destroyed
- D. Tens of billions of dollars in losses and associated costs.

2. More extreme wildfires are expected because of:

- A. Extreme tree mortality
- B. Increased fuel loads
- C. Climate change
- D. Continued urban development in and near wildlands.

Critical Challenges

Unstable Regional Economies

1. Less supply reliability = more economic volatility.
2. Agricultural costs statewide from the drought total more than \$1.8 billion, loss of 10,100 jobs.
3. Disproportionate harm to people with least capacity to respond to changes.

Critical Challenges

Changing Demands for Water

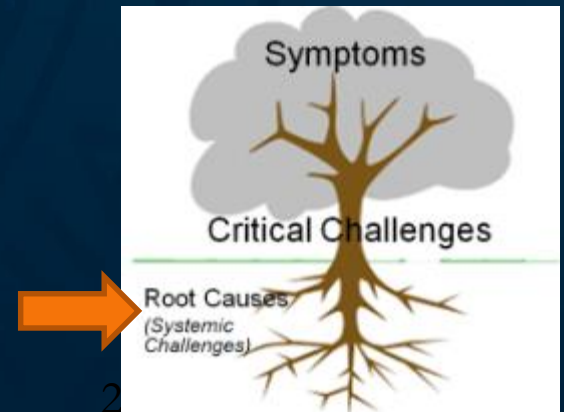
1. Population could increase from 39.4 million in 2016, to 51.1 million by 2060.
2. Urban water demand increase from 1 maf to 7 maf per year by the year 2050.
3. Potential decrease in agricultural water demand ranging from 2 million to 6 maf by 2050
4. Other challenges:
 1. Improvements in conservation and water use efficiency
 2. Shifts in agriculture to permanent crops.

Root Causes

Update 2018 provides strategic recommendations based on two questions:

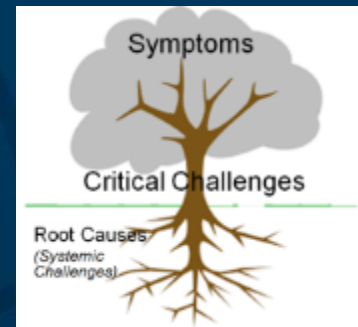
Why do these critical challenges exist?

Why do they persist?



Root Causes

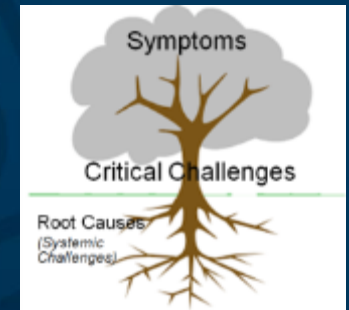
Fragmented and Non-Coordinated Initiatives and Governance



1. Lack of shared intent among plans.
2. Some instances of inadequate coordination between land-use and water planning.
3. More alignment of efforts needed among local, regional, State, and federal agencies and California Native American Tribes.

Root Causes

Inconsistent and Conflicting Regulations



Regulations are important for public health and safety, and environmental protection. Yet, at times:

1. Institutional silos.
2. Do not achieve their intended outcomes.
3. Focused on mitigating project impacts.
4. Do not balance environmental needs and human activities.
5. Not adaptive.

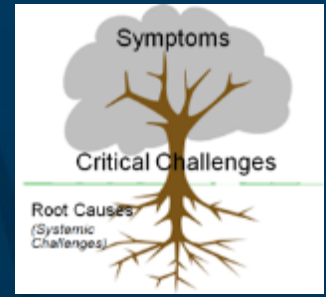
Root Causes

Insufficient Capacity for Data-Driven Decision-Making



1. Effective decisions = appropriate use and interpretation of data.
2. Access to the data technical information.
3. Data-sharing and management would benefit from:
 - A. Authoritative, open-access platform .
 - B. Integration of subject expertise and stakeholder perspectives.
 - C. Coordination and sharing among agencies.

Root Causes



Insufficient and Unstable Funding

1. Often inadequate, unpredictable, and inflexible to effectively fund all State responsibilities (including local assistance and cost-sharing).
2. Other challenges:
 - Changing public priorities.
 - Competition with other public services.
 - Reduced revenue collection.
 - Legal and jurisdictional constraints.
 - Flood management and ecosystem s face additional funding challenges.

California Water Plan Update 2018 Plenary

**Investing in a
Shared Vision for California's
Water Future**

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California Water Plan Update 2018

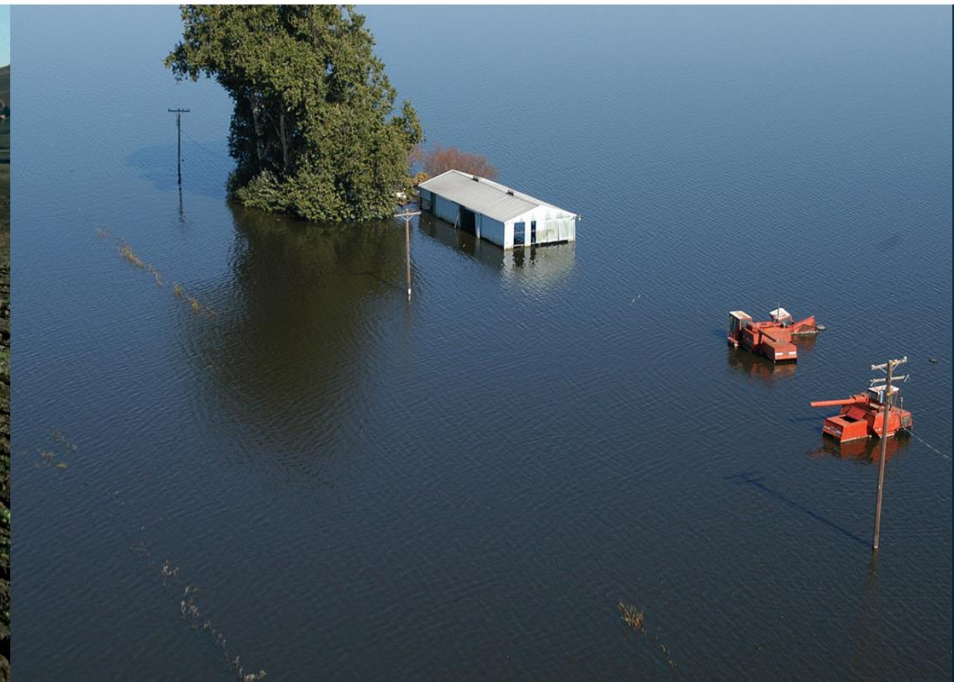
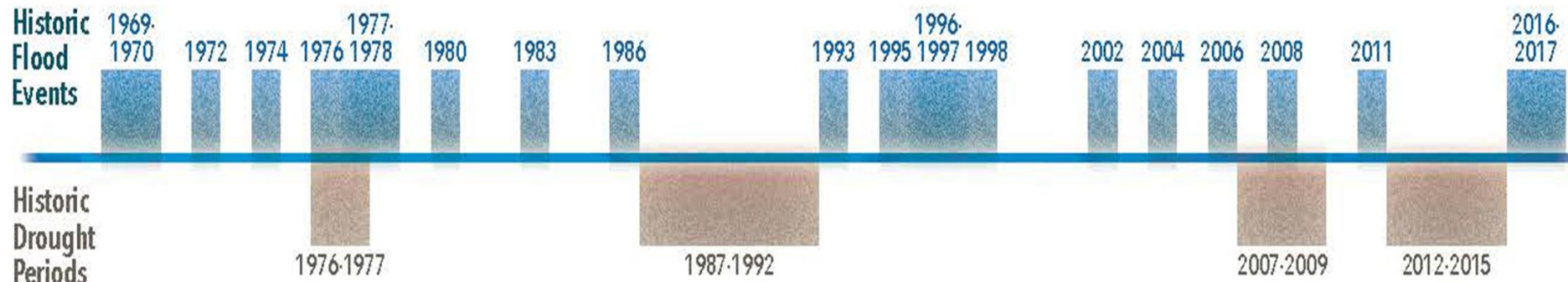
Investing in Shared Vision for CA Water Future



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California's Water Management

A Tale of Two Extremes



Challenges to Sustainability Threaten the People & Ecosystems of CA

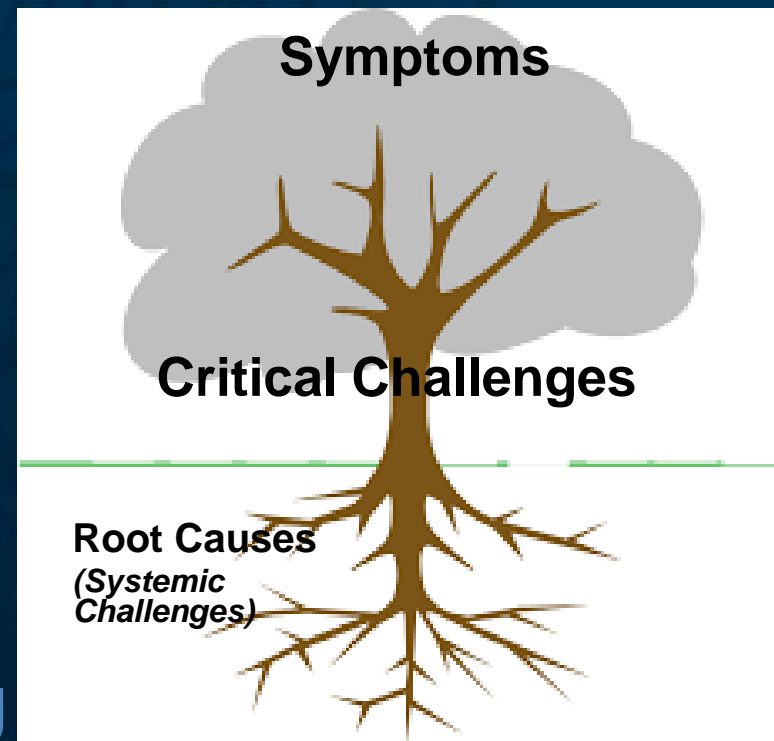
- ❖ Greater Drought Impacts - Unreliable Water Supplies
- ❖ Increasing Flood Risk
- ❖ Groundwater Depletion & Subsidence
- ❖ Degraded Water Quality
- ❖ Declining Environmental Conditions
- ❖ Aging Infrastructure
- ❖ Climate Change Impacts



Root Causes are Systemic Challenges

Overcoming them Increases Return on Investment

- ❖ Fragmented and uncoordinated decisions, initiatives & actions
- ❖ Inconsistent, inflexible, & conflicting regulations
- ❖ Insufficient capacity for data-driven decision-making
- ❖ Insufficient & unstable funding



California Water Plan Update 2018

Focus & Features

- ❖ Operational definition of sustainability
- ❖ CA Water Today
 - Challenges & Drivers
- ❖ Actionable recommendations
- ❖ NEW - Implementation Plan & Funding Options
- ❖ NEW - Annual Reports to track progress & adapt



California Water Plan Update 2018

Table of Contents – Under 100 pages

Chapter 1: Envisioning California Water Sustainability

Vision and goals to manage water resources for sustainability in California

Chapter 2: California Water Today

Conditions assessment – status, trends, accomplishments, and initiatives

Chapter 3: Actions For Sustainability

Recommended actions for the next 5 to 50 years

Chapter 4: Sustainability Outlook

Tracking sustainability and return on investment (outcomes, indicators & metrics)

Chapter 5: Investing in Water Resources Sustainability

Implementation cost, funding mechanisms, and funding scenarios

Chapter 6: Implementation Plan and Funding Options

Actions, actors, schedule & funding options

Reactive Water Management Is Not Sustainable

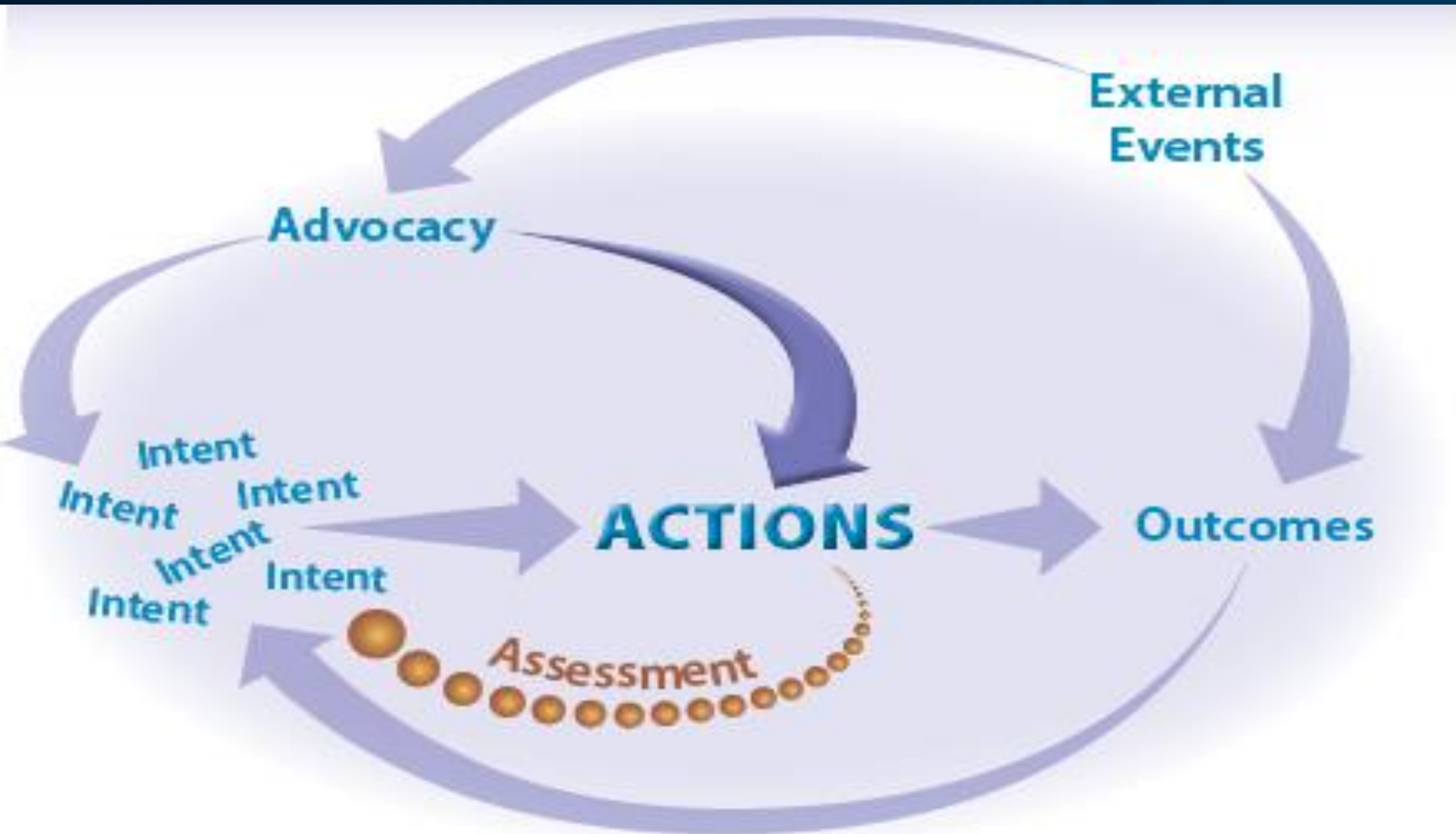
Historically, water management has been reactive and focused on individual projects

Repair + Ration + Regulate

... aging infrastructure ... in response to drought ... to respond to crises
& comply with statutes

Sustainability

Today's Water Management System Favors Advocacies and Actions



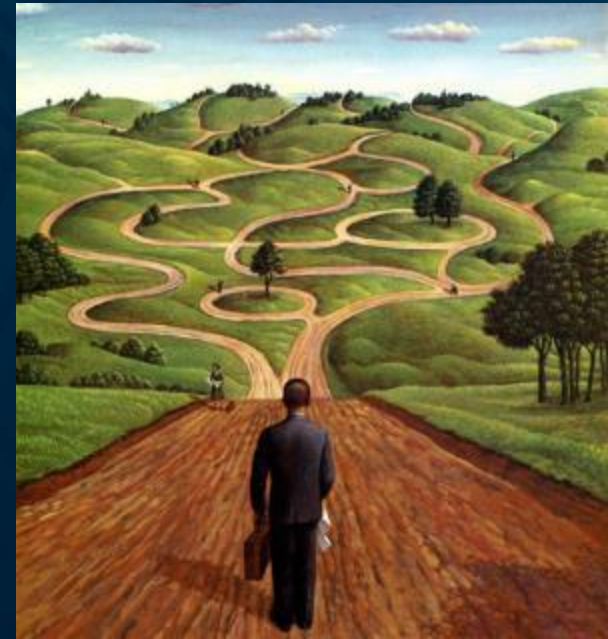
Water Resources Sustainability Requires Several Ingredients

- ❖ Taking a long view & vision
- ❖ Shared intent & outcomes
- ❖ Alignment & integration
- ❖ Consistency with what Californians value
- ❖ Time and commitment

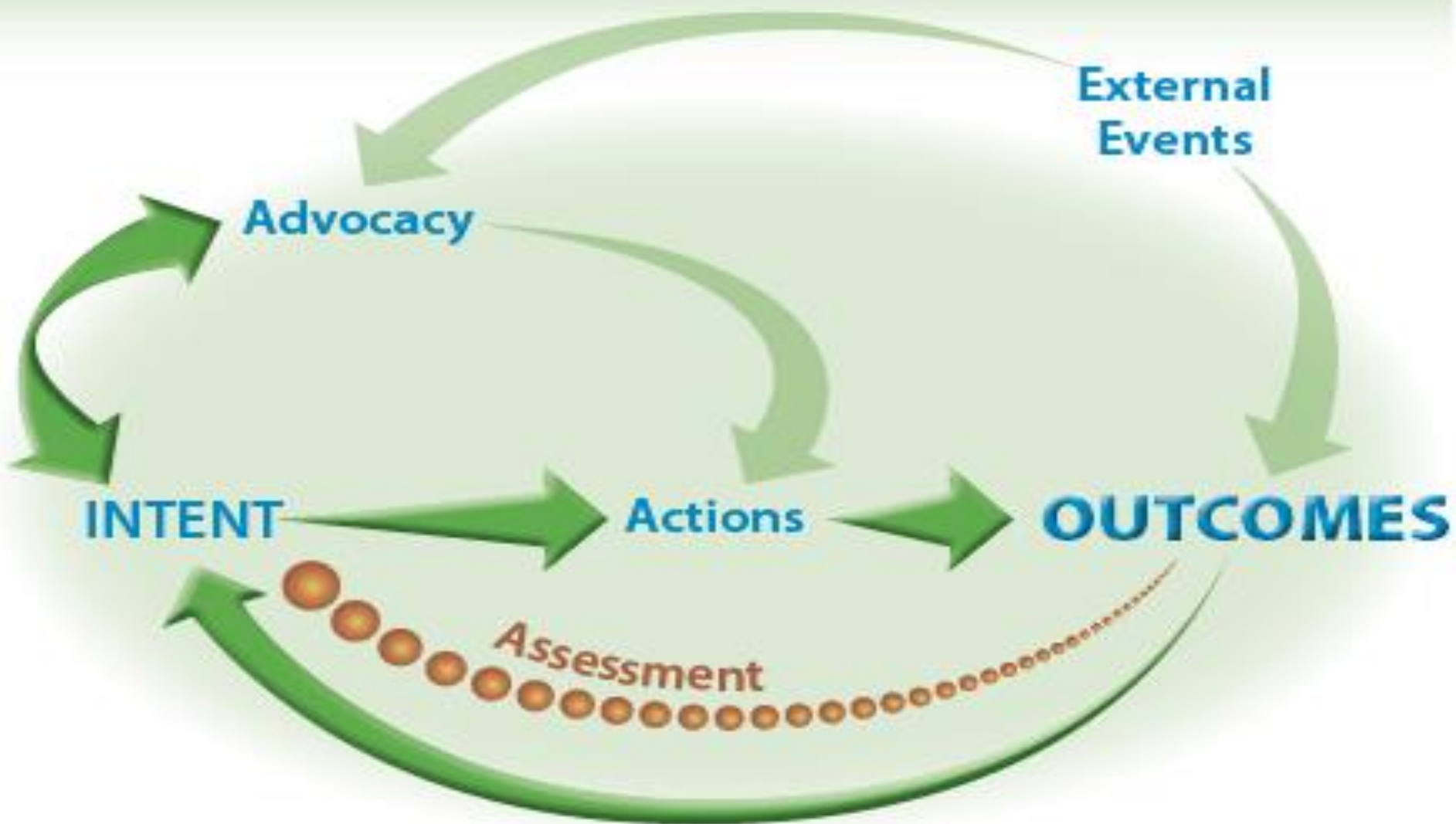


Sustainability Requires Taking a Long View & Vision

- ❖ All Californians are protected from health and safety threats and emergencies.
- ❖ California's economy is healthy and all Californians have opportunities for economic prosperity.
- ❖ Ecosystems in the state are thriving.
- ❖ All Californians have opportunities for enriching experiences.



Sustainability Requires Shared Intent & Outcomes



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Goals to Overcome Challenges

1. New & Modernized Infrastructure & Restored Ecosystems
2. Improved Alignment of Decisions, Initiatives & Actions
3. Improved Regulatory Outcomes
4. Informed & Adaptive Decision-Making
5. Sufficient and Stable Funding

Sustainability Requires Alignment & Integration

**Public
Financing**

**Flood
Management**

**Integrated
Watershed
Management**

Multi-Sector
Collaboration

**Ecosystem
Management**

**Groundwater
Management**

Multi-
Discipline
Planning

**Sustainable
Resource
Management**

**Water
Quality
Management**

**Water
Reliability
Management**

Multi-Benefit
Projects

Multi-Fund
Investments

**Ratepayer
Financing**

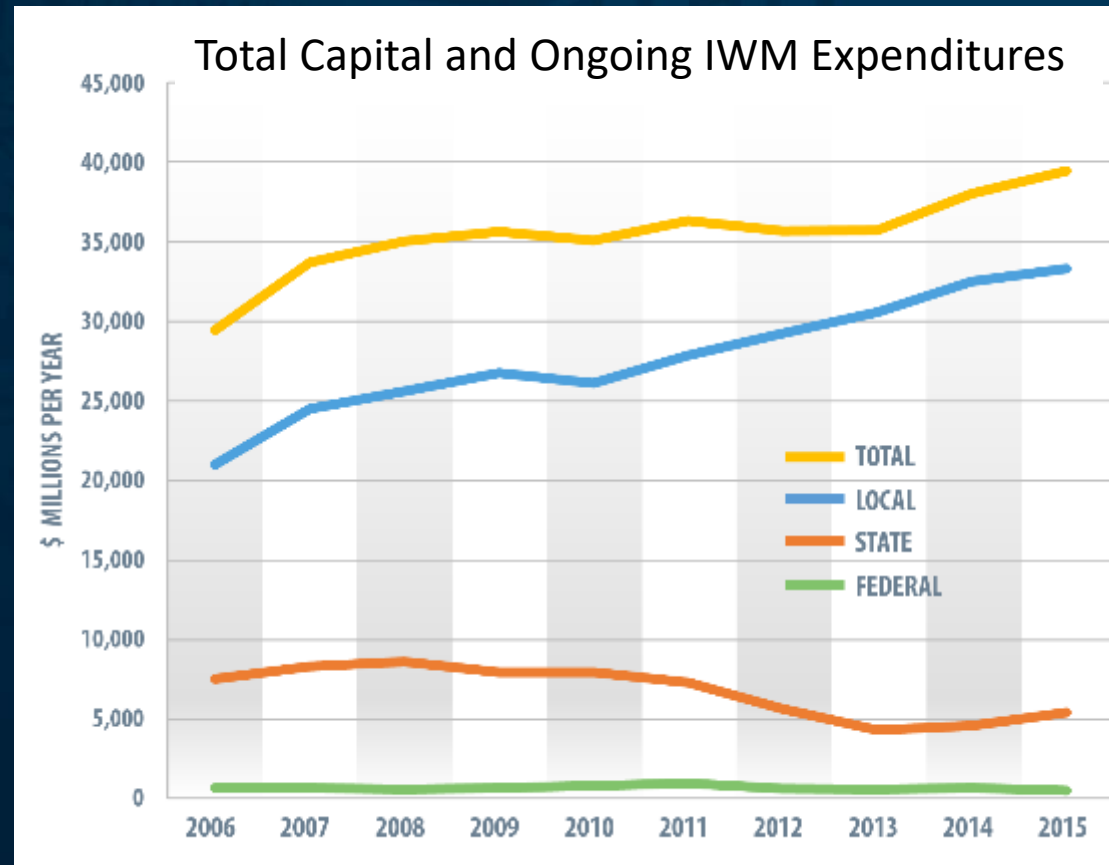
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Recommended Actions

- ❖ Improving integrated watershed management
- ❖ Improving resiliency and operational flexibility of infrastructure systems (green & grey)
- ❖ Building trust-based partnerships and empowering California's most vulnerable communities
- ❖ Improving real-time decision-making, adaptive management, and long-term planning
- ❖ Improving inter-agency alignment and addressing persistent regulatory challenges
- ❖ Providing sufficient and stable funding

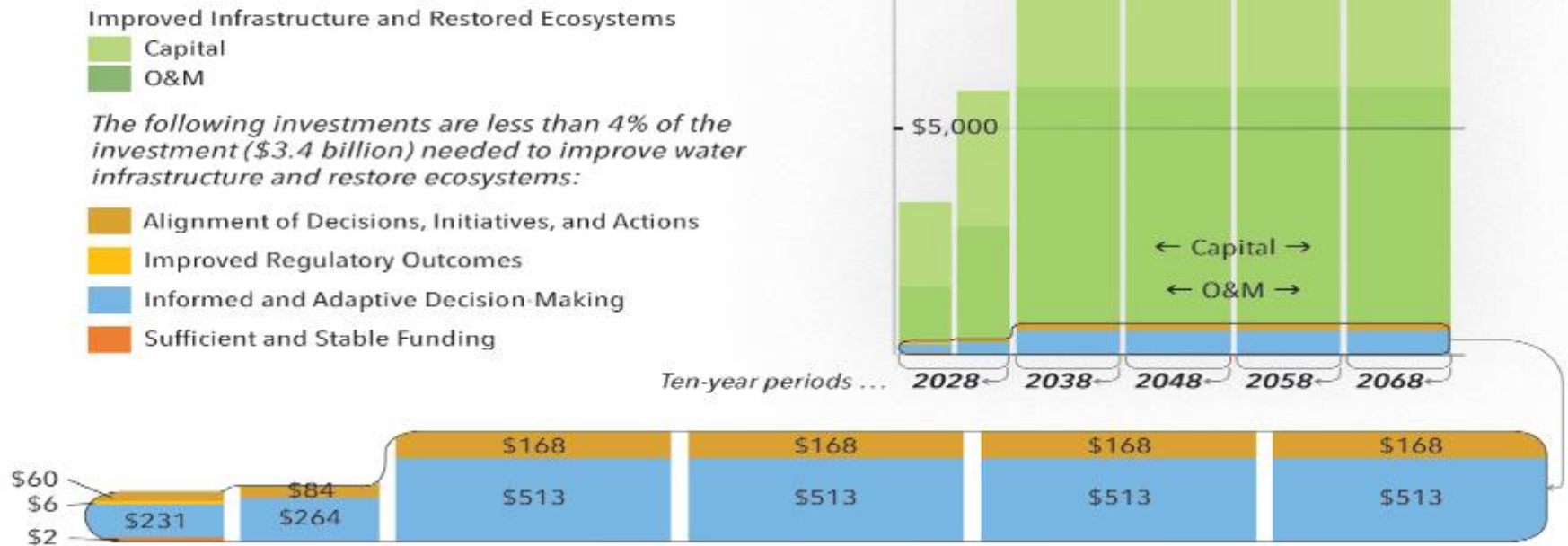
Sustainability Requires Sufficient & Stable Funding

- ❖ State expends ~ \$2 Billion/year on water management
- ❖ State allocates only 2% of State General Fund for water
- ❖ Local/regional entities pay ~ 80% of investment
- ❖ Investment backlog is *at least* \$350 Billion over next 50 years



50-Year State Water Investment Plan

- **\$80 Billion** – State Cost Share for Local/Regional Green & Grey Infrastructure Projects (Capital/O&M)
- **\$10 Billion** – State Projects (Capital/O&M)
- **\$3.4 Billion** – Actions to overcome systemic challenges (root causes)



Sustainability Requires Consistency with Values



The combined effect of actions and projects within watersheds and groundwater basins is consistent with the four societal values, while fostering trust and promoting equity.



The Sustainability Outlook

Demonstrate Return on Investment

Sample Societal
Value



**Public
Health &
Safety**

Sample Intended
Outcome

**An adequate water
supply for domestic
needs, sanitation, and
fire suppression**

Sample Sustainability
Indicator

**Number of public water
systems (population
served) not in compliance
with drinking water
standards**

4

1 dozen

3 dozen

Update 2018 Watershed-Scale Pilots Outlook is Aggregate of Regional Sustainability

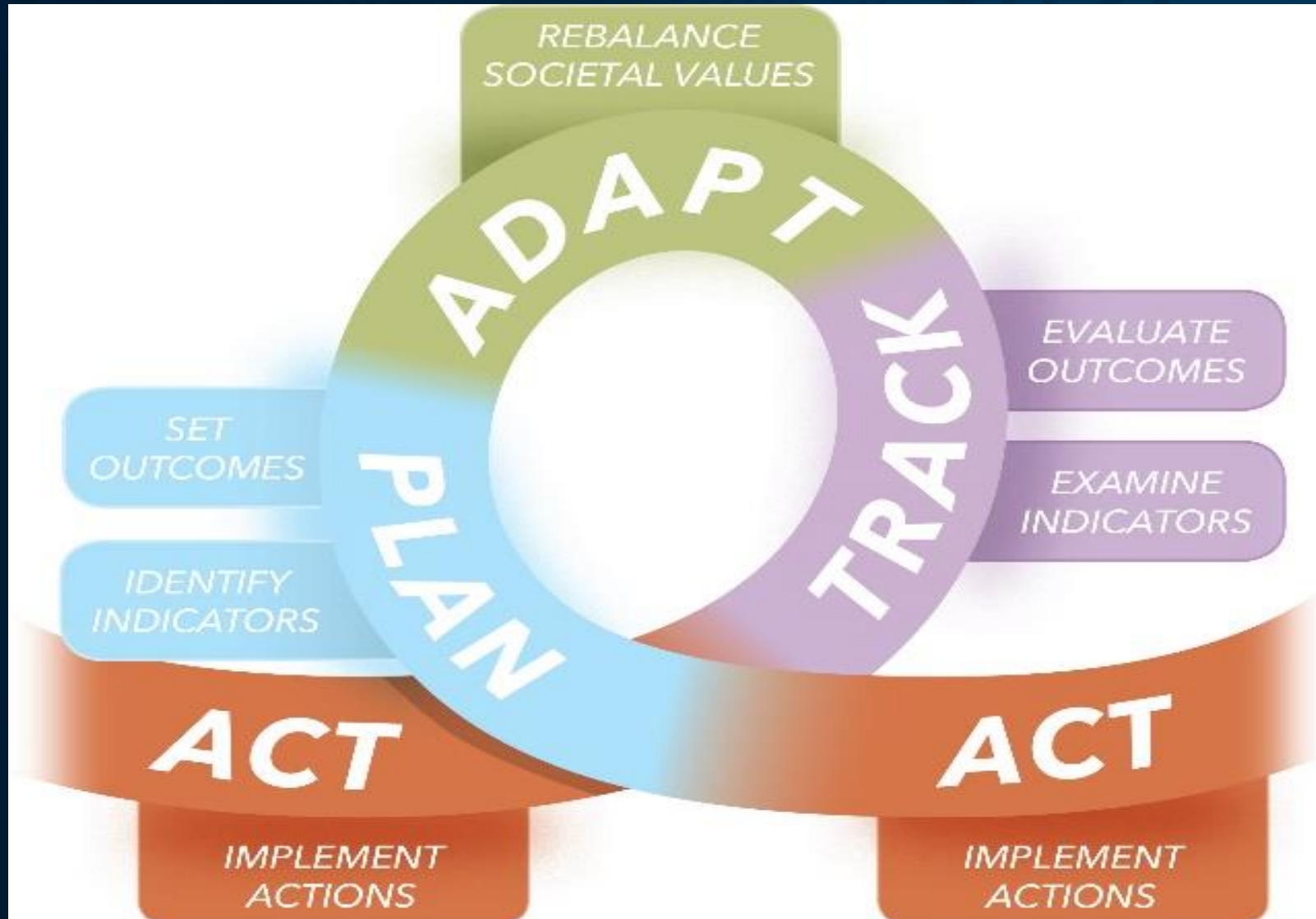
❖ **Applying Sustainability Outlook locally**

- Proof of concept & scalability of indicators
- Local/regional perspectives on impediments to sustainability
- Place-based solutions for governance, regulations & funding

❖ **Initiated pilot projects in partnership with:**

- California Forward
- Pacific Institute
- Water Foundation
- Sonoma County Water Agency
- Santa Ana Watershed Project Authority

Sustainability Requires Tracking & Adaptive Management



Sustainability Requires Time & Commitment

It is a Journey, not a Destination



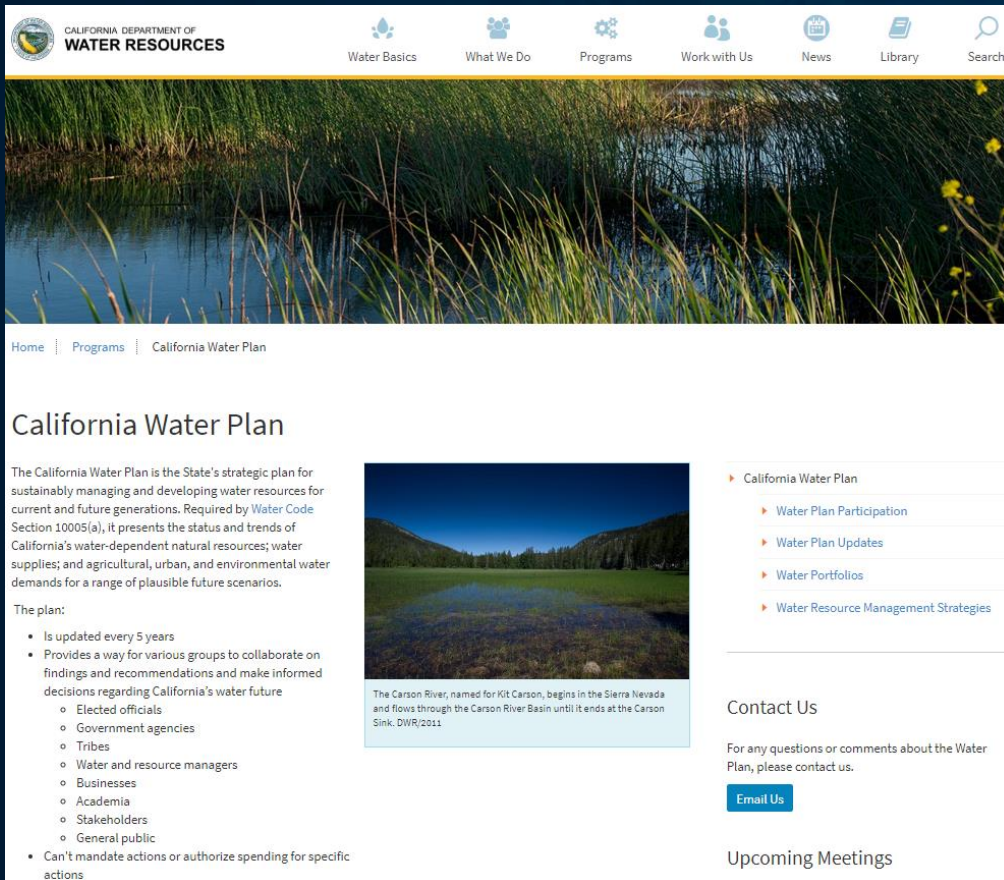
Update 2018 Sets the Stage for a More Effective Long-Term Adaptation

Applying Update 2018 Tools The Way Forward

- ❖ ***Vision*** – Shared intent and outcomes to align actions
- ❖ ***Recommended Actions*** – Reflect State priorities and values
- ❖ ***Sustainability Outlook*** – Track outcomes/return on investment
- ❖ ***Funding Options*** – Stable funding for effective action
- ❖ ***Implementation Plan*** – Authorize & initiate actions/projects

Ways to Access Water Plan Information

➤ Visit the Water Plan Web Portal



The screenshot shows the California Department of Water Resources website. The header includes the department's name and a navigation bar with icons for Water Basics, What We Do, Programs, Work with Us, News, Library, and Search. Below the header is a large image of a wetland. The main content area is titled "California Water Plan" and includes a description of the plan's purpose, a list of the plan's goals, and a sidebar with links to various resources. A contact section is also visible.

CALIFORNIA DEPARTMENT OF WATER RESOURCES

Water Basics | What We Do | Programs | Work with Us | News | Library | Search

California Water Plan

The California Water Plan is the State's strategic plan for sustainably managing and developing water resources for current and future generations. Required by Water Code Section 10005(a), it presents the status and trends of California's water-dependent natural resources; water supplies; and agricultural, urban, and environmental water demands for a range of plausible future scenarios.

The plan:

- Is updated every 5 years
- Provides a way for various groups to collaborate on findings and recommendations and make informed decisions regarding California's water future
 - Elected officials
 - Government agencies
 - Tribes
 - Water and resource managers
 - Businesses
 - Academia
 - Stakeholders
 - General public
- Can't mandate actions or authorize spending for specific actions

California Water Plan

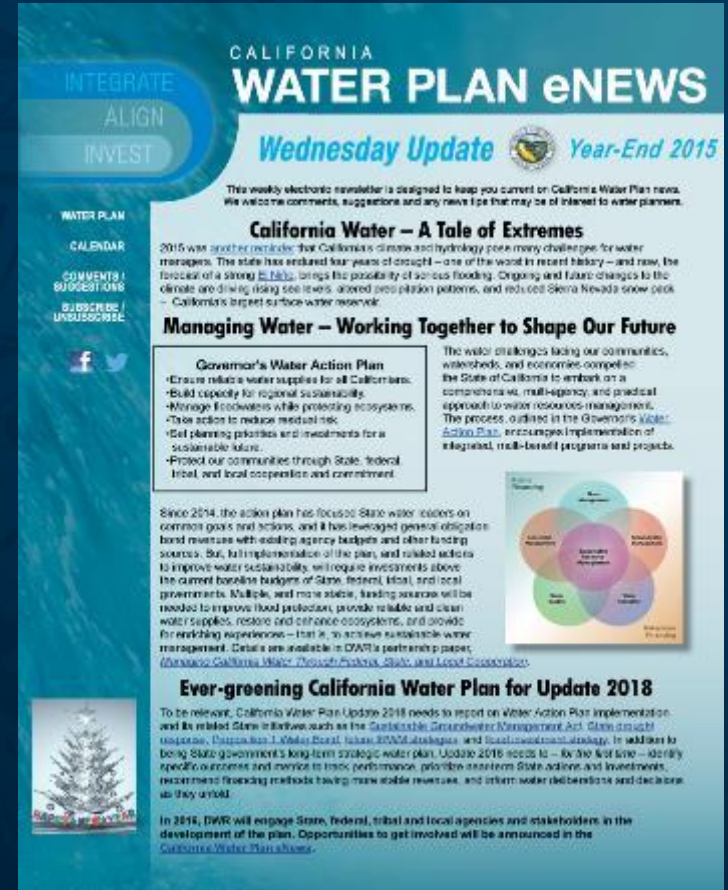
- ▶ Water Plan Participation
- ▶ Water Plan Updates
- ▶ Water Portfolios
- ▶ Water Resource Management Strategies

Contact Us

For any questions or comments about the Water Plan, please contact us.

[Email Us](#)

Upcoming Meetings



The screenshot shows the California Water Plan eNews newsletter. The header includes the title "CALIFORNIA WATER PLAN eNEWS" and the date "Wednesday Update Year-End 2015". The main content area features several articles, including "California Water – A Tale of Extremes", "Managing Water – Working Together to Shape Our Future", and "Ever-greening California Water Plan for Update 2018". A sidebar on the left contains links to the Water Plan, Calendar, Comments, and Documents. A diagram on the right illustrates the "Ever-greening" process.

CALIFORNIA WATER PLAN eNEWS

Wednesday Update Year-End 2015

This weekly electronic newsletter is designed to keep you current on California Water Plan news. We welcome comments, suggestions and any news tips that may be of interest to water planners.

California Water – A Tale of Extremes

2015 was another reminder that California's climate and hydrology pose many challenges for water managers. The state has endured four years of drought – one of the worst in recent history – and now, the forecast of a strong El Niño brings the possibility of serious flooding. Ongoing and future changes to the climate are driving rising sea levels, altered precipitation patterns, and reduced Sierra Nevada snow pack – California's largest surface water reservoir.

Managing Water – Working Together to Shape Our Future

The water challenges facing our communities, watersheds, and economies compel the State of California to embark on a comprehensive, multi-agency, and practical approach to water resources management. The process, outlined in the *Governor's Water Action Plan*, encourages implementation of integrated, multi-benefit programs and projects.

Governor's Water Action Plan

- Create reliable water supplies for all Californians.
- Build capacity for regional sustainability.
- Manage floodwaters while protecting ecosystems.
- Take action to reduce residential water use.
- Set planning priorities and investments for a sustainable future.
- Protect our communities through State, federal, tribal, and local cooperation and commitment.

Since 2014, the action plan has focused State water leaders on common goals and actions, and it has leveraged general obligation bond revenues with existing agency budgets and other funding sources. But, full implementation of the plan, and related actions to improve water sustainability, will require investments above the current baseline budgets of State, federal, tribal, and local governments. Multiple, and more stable, funding sources will be needed to improve flood protection, provide reliable and clean water supplies, restore and enhance ecosystems, and provide for enriching experiences – that is, to achieve sustainable water management. Details are available in DWR's partnership paper, *Manage California Water Through Partners, State, and Local Cooperation*.

Ever-greening California Water Plan for Update 2018

To be relevant, California Water Plan Update 2018 needs to report on Water Action Plan implementation, and its related State initiatives such as the Sustainable Groundwater Management Act, State drought response, California's Water Bond, Urban RWQF strategies, and flood resilience strategy. In addition to being State government's long-term strategic water plan, Update 2018 needs to – for the first time – identify specific outcomes and metrics to track performance, prioritize near-term State actions and investments, recommend financing methods to bring more stable revenues, and inform water deliberations and decisions as they unfold.

In 2018, DWR will engage State, federal, tribal and local agencies and stakeholders in the development of the plan. Opportunities to get involved will be announced in the *California Water Plan eNews*.

➤ Subscribe to Water Plan eNews

Questions & Comments



Kamyar Guivetchi, PE

kamyar.guivetchi@water.ca.gov

Statewide Integrated Water Management
CA Department Water Resources

California Water Plan Update 2018 Plenary

Management Tools and Strategies in Action

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California Water Plan Update 2018 Plenary

Working Lunch

California Water Plan Update 2018 Plenary

Keynote Speaker
California State Controller
Betty T. Yee

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Interactive Gaming Demonstration

California Water Plan Update 2018

Making decisions within dynamic and complex systems



Paul Massera, P.E.

Water Plan Program Manager

October 9, 2018 | Water Plan Plenary

Session Purpose



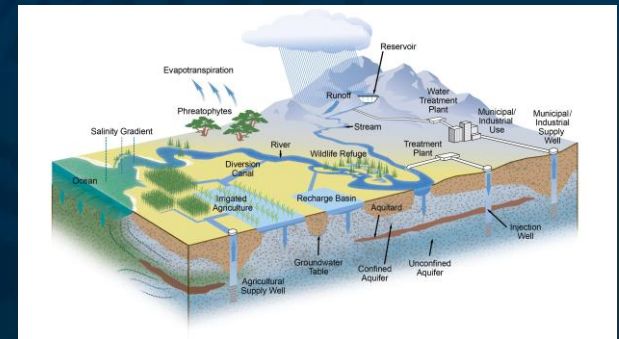
Participants experience the power of models to support decision-making:

- Without all desired information
- Using limited management options
- Within a complex and interconnected system

System Scale Management

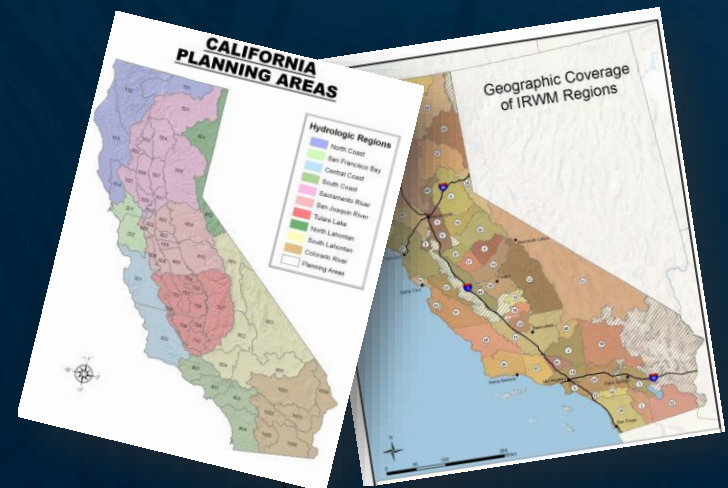
Geographical Scale of Today's Demo Activity:

- Watershed (example)



Potential Scales of SimBasin:

- GSA or GSP Area
- IRWM
- Hydrologic Regions
- ...



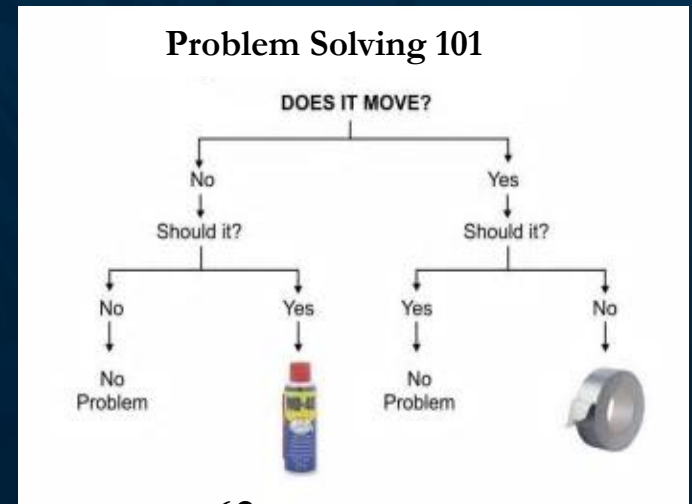
Statewide water management “Wicked” Dilemmas

Life was simpler back when I knew-it-all



Next Gen Decision Support

1. Decisions must be made now.
2. Need more than mental models and advocacy.
3. Data enables more effective investment.
4. Iteration/adaption within complex systems.
5. Cross-disciplines, sectors, and jurisdictions.



SimBasin:

1. Enables stakeholders and scientists to critically compare mental and computer models, with useful shared-insights gained.
2. Simulates past and future decisions.
3. Promotes “serious gaming” as a viable planning tool.
4. Fosters a sense of urgency for it’s development and expanded use.

Final Thoughts (SimBasin)

1. Effective decision-making requires more than mental models and advocacy.
2. Analytical tools can be used to manage at hydrologic scale using existing institutions.
3. SimBasin-type tools can be effectively coordinated with many aspects of the California Water Plan.
4. Data-based decisions are only as good as the data.

California Water Plan Update 2018 Plenary

Break
Will return in 15 mins

California Water Plan Update 2018 Plenary

Impact of Recent Court Decisions on California Water

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The Foundation of the Water Plan Data Driven Decision Making

CALIFORNIA DEPARTMENT OF WATER RESOURCES

California Water Plan Update 2018 Plenary

Data-Driven Decision-Making

Jennifer Kofoid

Jennifer.Kofoid@water.ca.gov

916 / 653-7574

Data-Driven Decision-Making

Water Balances *Tito Cervantes*

Water Budgets *Paul Shipman*

Climate Change *Emily Alejandrino*

Future Scenarios *Mohammad Rayej*

Land Use *Curtis Anderson*

Remote Sensing with Drones *Gary Darling*

Watershed Mapping *Matthew Correa*

Stormwater Targets *Nirmala Benin*

Recycled Water Use *Richard Mills*

Water Conservation *Peter Brostrom*

Open and Transparent Data *Chris McCready*

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Data-Driven Decision-Making

Water Balances

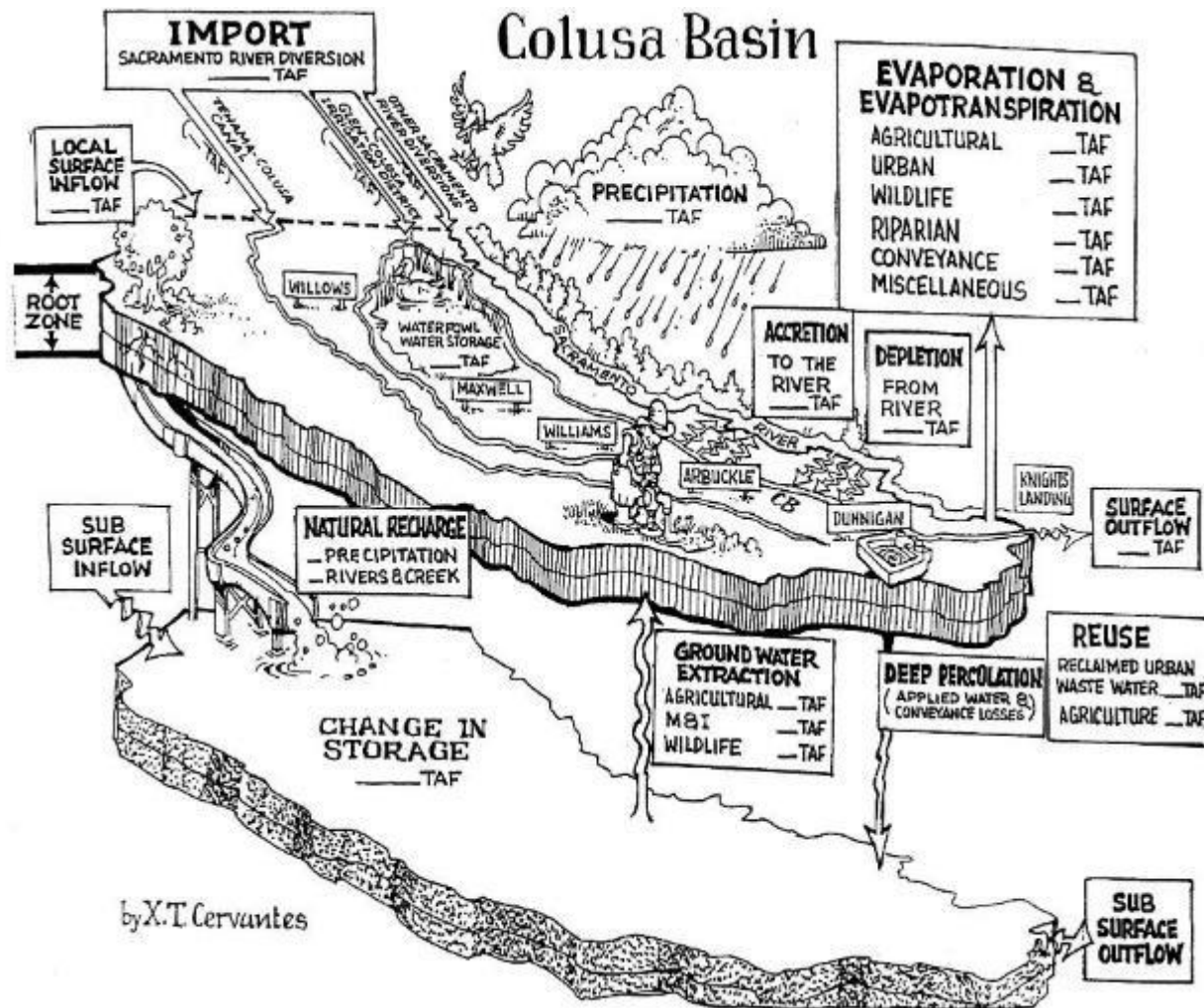
Tito Cervantes

Tito.Cervantes@water.ca.gov

530 / 529-7389

water.ca.gov/Programs/California-Water-Plan/Water-Portfolios

Water Balances Key Components



Water Balances Decision-Making

- Local collaboration, data by county
- Water supply by sector
- Transparency
- Improving technology and water management decisions
- Water quality and climate change
- Tribal, SGMA, and Delta Fix
- Annual basis

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Data-Driven Decision-Making

Water Budgets

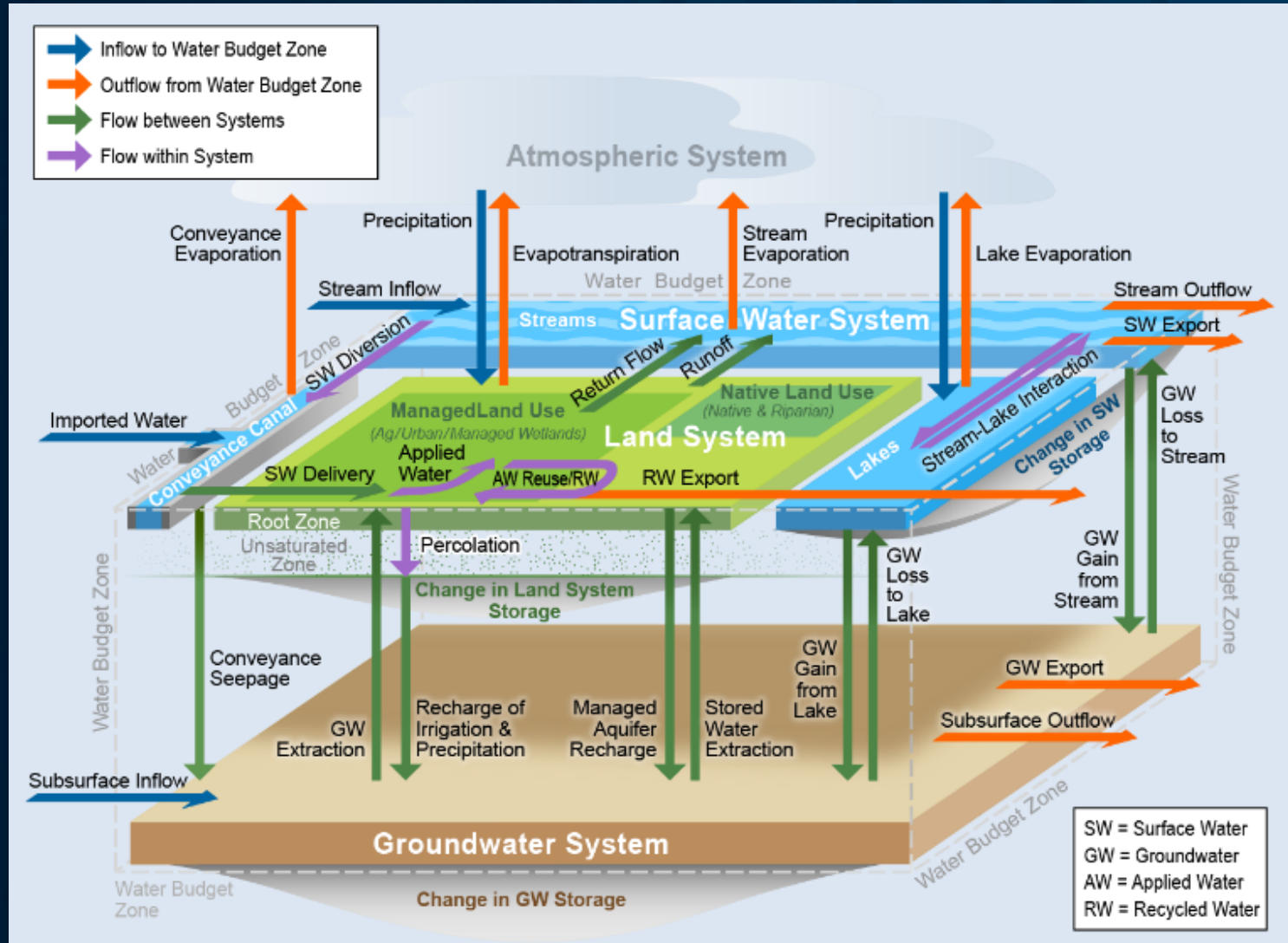
Paul Shipman

Paul.Shipman@water.ca.gov

916 / 651-9245

public.tableau.com/profile/salma7330#!/vizhome/RegionalWaterBudget_Basins_Published_4/BaseMaps

Water Budgets Key Components



Water Budgets Decision-Making

- *Water Budget Development Practitioner's Handbook*
 - Establishes framework and common vocabulary
 - Describes components
 - Provides estimation methods and examples
 - Furnishes catalogue of data sources
- Water budget dashboards
 - At-a-glance water budget summaries



Questions?

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Data-Driven Decision-Making

Climate Change

Emily Alejandrino

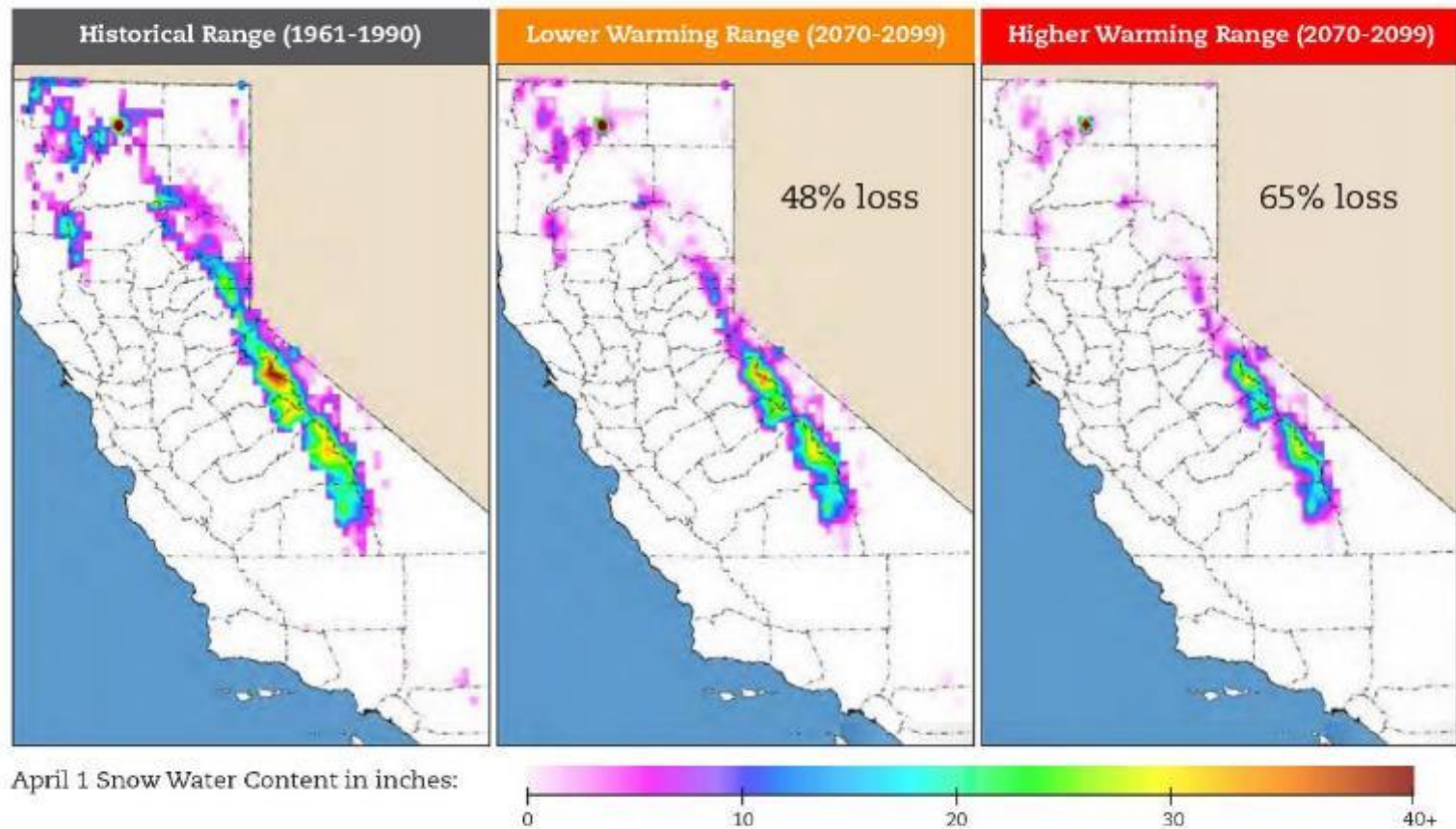
Emily.Alejandrino@water.ca.gov

916 / 949-1064

water.ca.gov/Programs/All-Programs/Climate-Change-Program

Climate Change Key Components

Historical and Projected California Snowpack



Historical and projected April 1 Snow Water content for the Sierra for lower and higher warming scenarios depicting the effect of human generated greenhouse gases and aerosols on climate. By the end of this century, the Sierra snowpack is projected to experience a 48 to 65 percent loss from its average at the end of the previous century.

Climate Change Decision-Making

- DWR's climate change program
 - Climate mitigation and adaptation
 - Water supply, reliable flood control, and healthy ecosystems
- *Climate Action Plan*
- What's next?
 - Work with water managers
 - *CWP Update 2018*
 - Action 4.7.3 Climate Science and Monitoring Program

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Data-Driven Decision-Making

Future Scenarios

Mohammad Rayej

Mohammad.Rayej@water.ca.gov

916 / 653-8017

Future Scenarios Key Components

- What is it?
 - Future water conditions to 2100
 - 20 climate scenarios x 5 urban growths scenarios = 100 scenarios
 - Central Valley, California
 - Water Evaluation And Planning Model (WEAP)
- Current and future activities
 - Post-processing of model results
 - **New technical report:** *Future Scenarios of Water Supply and Demand in Central Valley, California Through 2100*
 - Web-based Tableau Dashboard

Future Scenarios Decision-Making

- Water supply and demand
 - Unmet demand
 - Maps of vulnerable areas
 - Supply reliabilities
- What to improve?
 - Expand statewide
 - Data storage
 - Faster web-browser
 - Communication and access for all data users

CALIFORNIA DEPARTMENT OF WATER RESOURCES

Data-Driven Decision-Making

Land Use

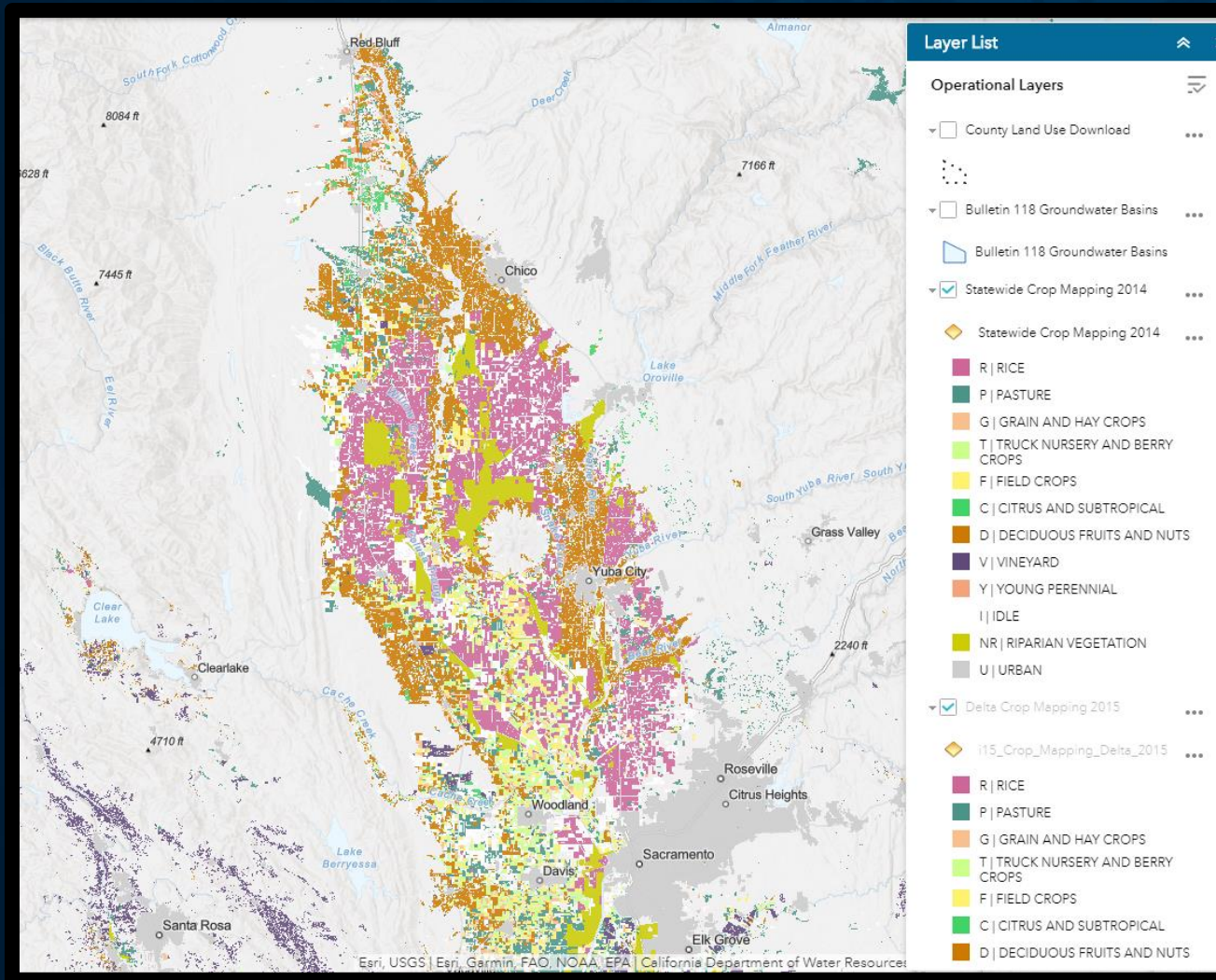
Curtis Anderson

Curtis.Anderson@water.ca.gov

530 / 529-7348

gis.water.ca.gov/app/CADWRLandUseViewer

Land Use Key Components



Land Use Decision-Making

- Statewide crop mapping for 2014 used remote sensing technology for first time ever!
- What's next?
 - 2016 statewide
 - 2018 statewide, with multi-cropping included
- 4,500 unique users and 370 downloads
- Foundational data set
 - California Water Plan
 - Sustainable groundwater management
 - Water use efficiency
 - Water management planning at all levels

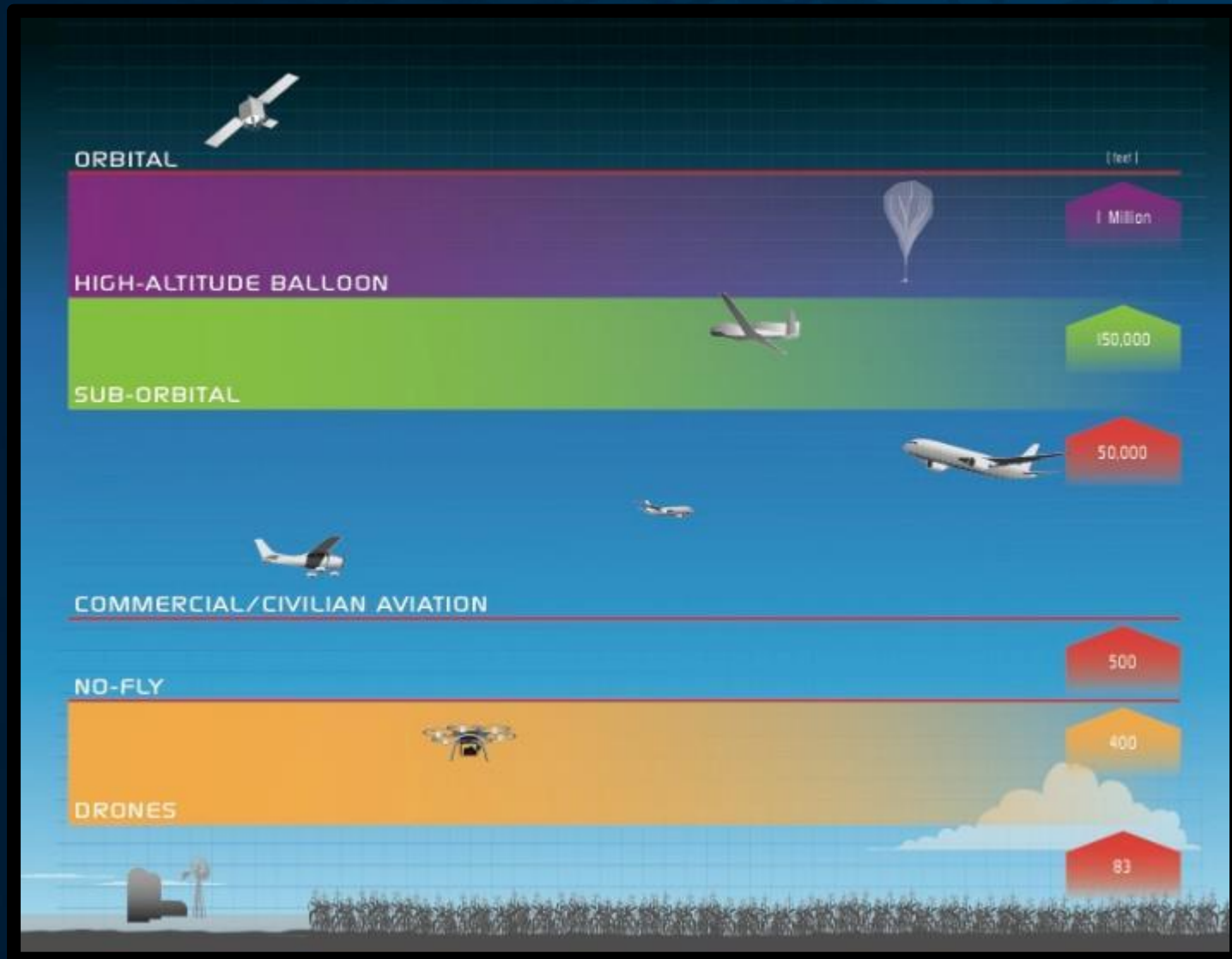
Remote Sensing with Drones

Gary Darling

Gary.Darling@water.ca.gov

530 / 564-9867

Remote Sensing with Drones



Remote Sensing with Drones

Decision-Making

- Drone policies, procedures, forms
- Environmental
- Flood management
- Construction, operations, and maintenance
- Hydrodynamic modeling
- Energy
- Precision agriculture

CALIFORNIA DEPARTMENT OF WATER RESOURCES

Data-Driven Decision-Making

Watershed Mapping

Matthew Correa

Matthew.Correa@water.ca.gov

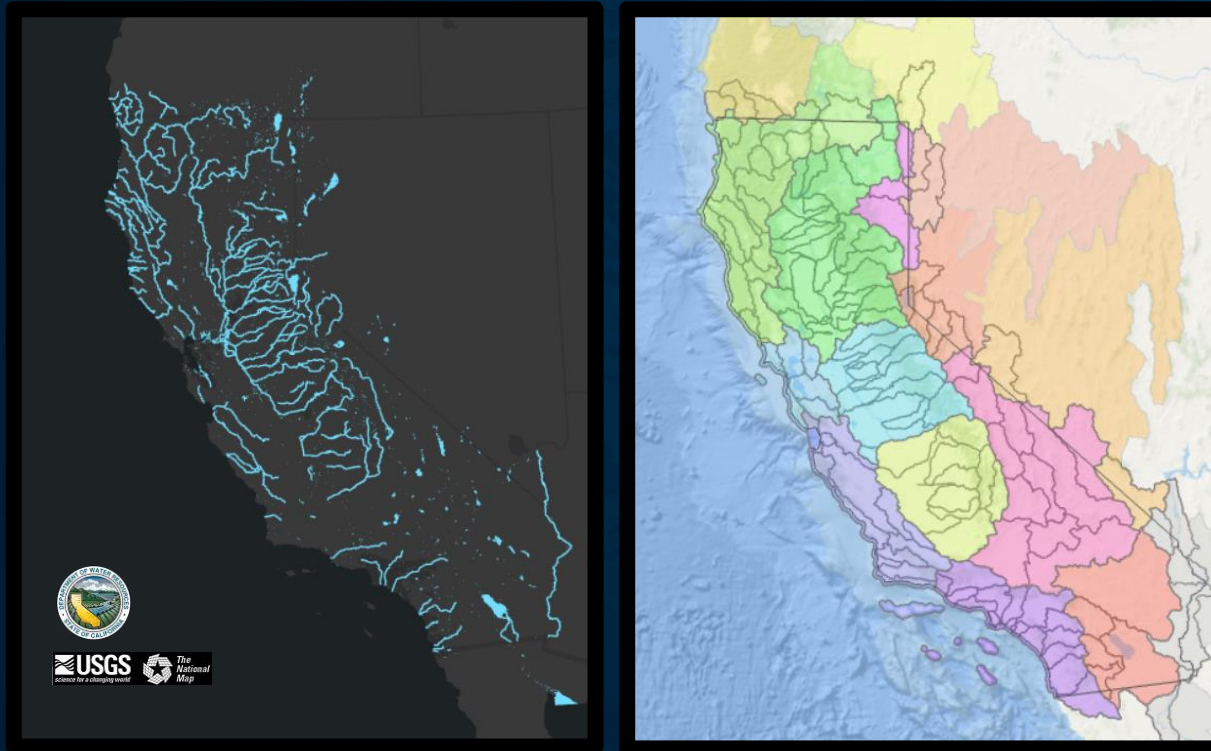
916 / 651-9640

Jane.Schafer-Kramer@water.ca.gov


916 / 653-4441

wdl.water.ca.gov/waterdatalibrary/NHD/index.cfm

Watershed Mapping Key Components



- State-federal partnership
 - National Hydrography Dataset
 - Watershed Boundary Dataset
- Improved mapping of watersheds and water features



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National Hydrography Dataset (NHD)

3 Followers


The USGS National Hydrography Dataset (NHD) Downloadable Data Collection From The National Map (TNM) is a comprehensive set of digital spatial data that encodes information about naturally occurring and constructed bodies of water (lakes, ponds, and reservoirs), paths through which water flows (canals, ditches, streams, and rivers), and related entities such as point features (springs, wells, stream gages, and dams). The information encoded about these features includes classification and other characteristics, delineation, geographic name, position and related measures, a "reach code" through which other information can be related to the NHD, and the direction of water flow. The network of reach codes delineating water and transported material allows us to trace movement in upstream and downstream directions. In addition to this geographic information, the dataset contains metadata that supports the exchange of future updates and improvements to the data. The NHD supports many applications, such as making maps, geocoding, observations, flow modeling, data maintenance, and stewardship. For additional information on NHD, go to <https://nhd.usgs.gov/>.

DWR is the steward for NHD and Watershed Boundary Dataset (WBD) in California. We work with other organizations to edit and improve NHD and WBD, using the business rules for California. This is a process that takes time with a State as large and diverse as California. California's NHD improvements are sent to USGS, and accessible from their website.

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Data and Resources




[The National Map - Download Viewer](#)

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[USGS - FTP Download](#)

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[The National Map - Service Endpoints](#)


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[National Hydrography Base Map Service \(ArcGIS\)](#)

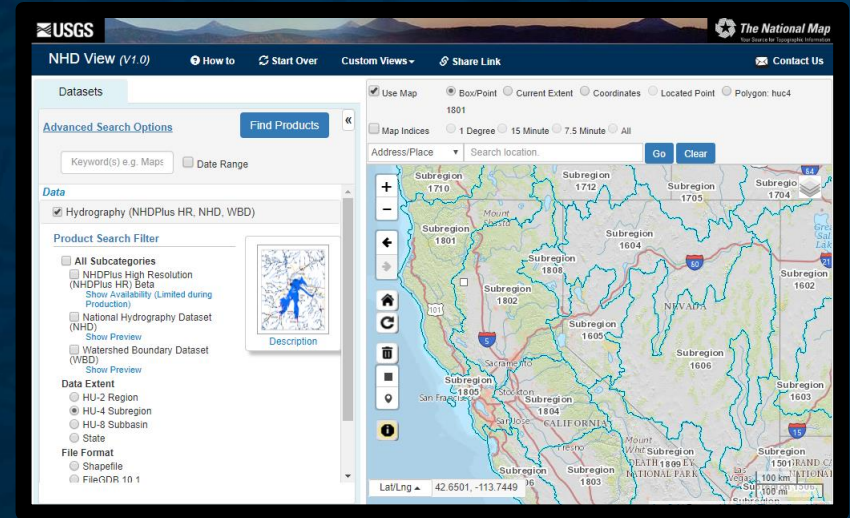
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California Department of Water Resources

DWR manages California's water resources, systems, and



- Data stewardship
- Seamless geospatial framework
 - Modeling
 - Analysis
 - Visualization

CALIFORNIA DEPARTMENT OF WATER RESOURCES

Data-Driven Decision-Making

Stormwater Targets

Nirmala Benin

Nirmala.Benin@water.ca.gov

916 / 651-9848

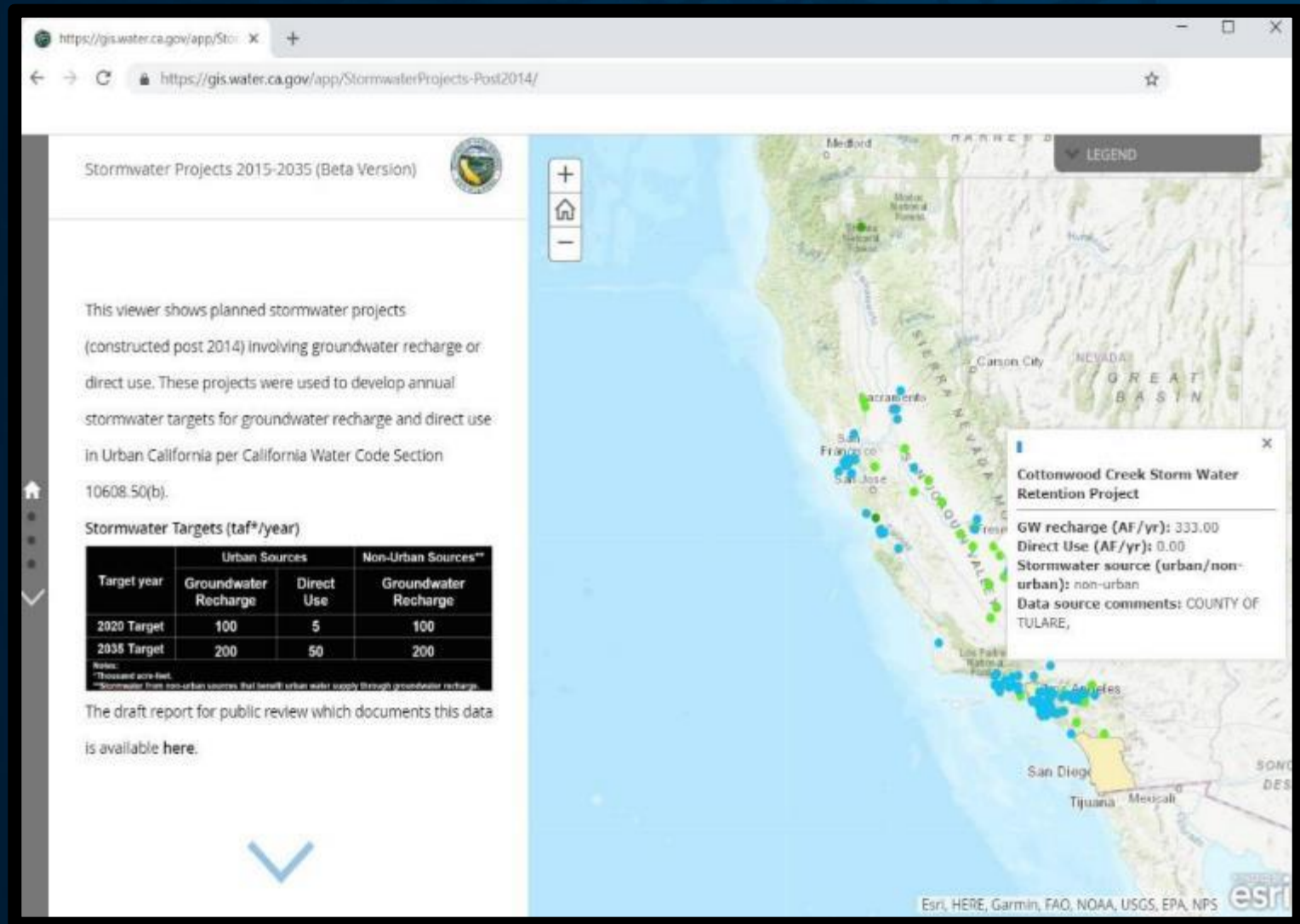
gis.water.ca.gov/app/StormwaterProjects-Post2014

Stormwater Targets Decision-Making

- Statewide targets for groundwater recharge and direct use of urban stormwater
- Draft report available for public comment
 - Webinar with Q&A session: October 18
 - Comments are due: Oct 31
- Updated RMS for urban stormwater



Stormwater Targets Key Components



CALIFORNIA DEPARTMENT OF WATER RESOURCES

Data-Driven Decision-Making

Recycled Water Use

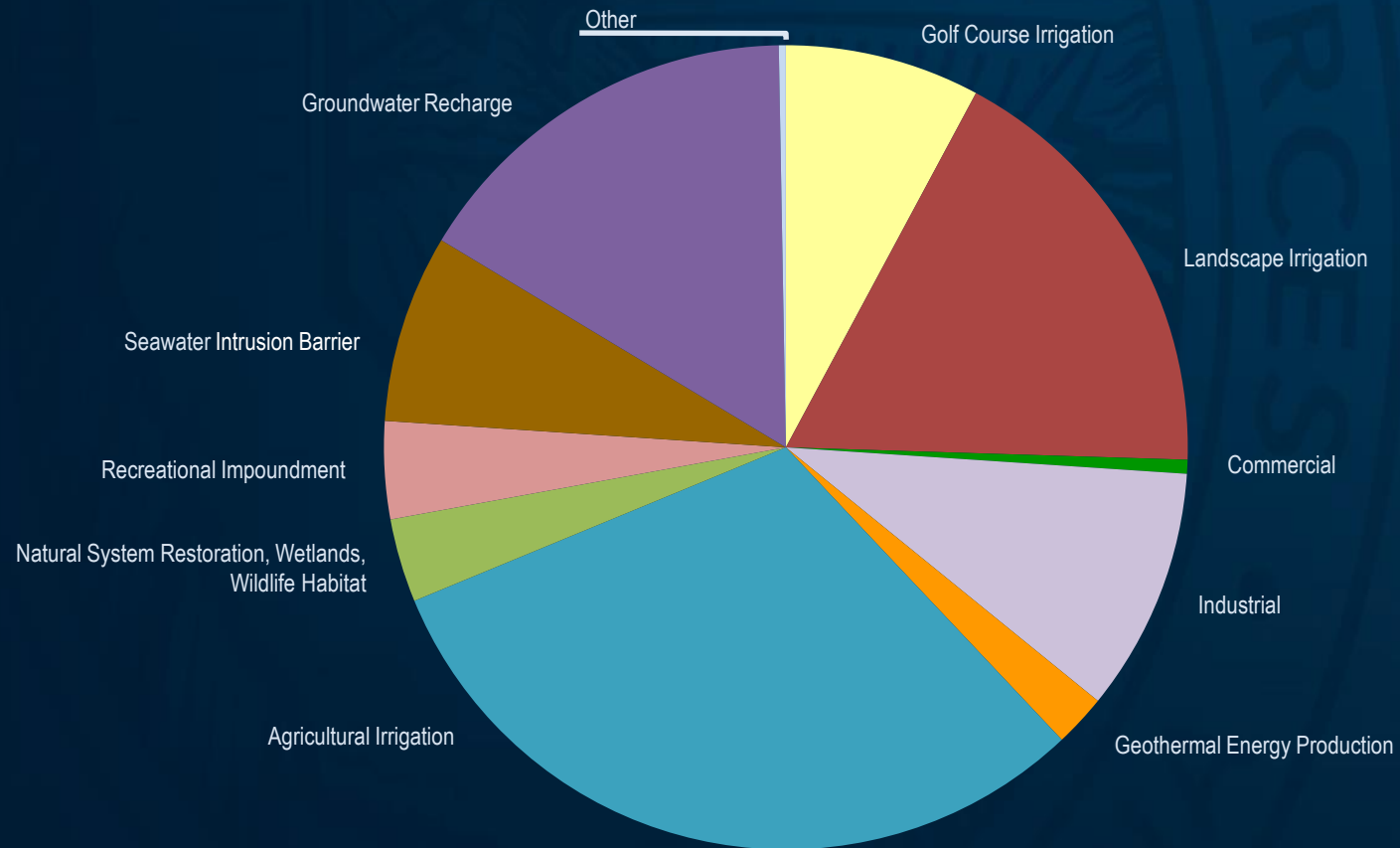
Richard Mills

Richard.Mills@water.ca.gov

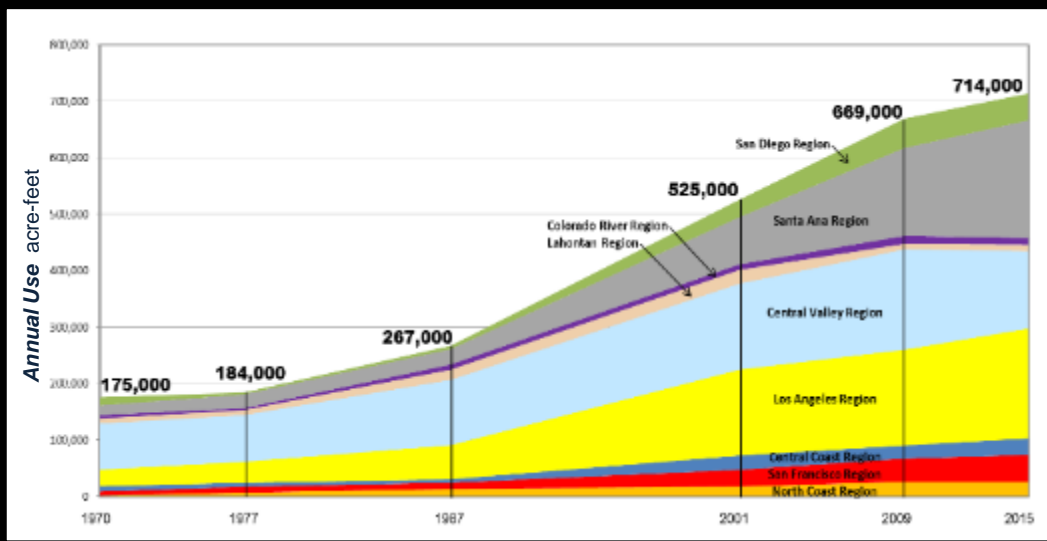
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waterboards.ca.gov/water_issues/programs/grants_loans/water_recycling/munirec.shtml

Recycled Water Type and Quantity



Recycled Water Location and Collection



- DWR / SWRCB survey
- UWMPs
- Primary data user is the California Water Plan team

Recycled Water

- Geospatial referencing of recycled water systems



Los Angeles – RW distribution system



- RW Use Area
- ★ Wastewater Treatment Plant

- Fall 2018 SWRCB revision to the recycled water policy
- Modifications to the 2020 Urban Water Management Plan reporting
- Desalination data in the next CWP

CALIFORNIA DEPARTMENT OF WATER RESOURCES

Data-Driven Decision-Making

Water Conservation

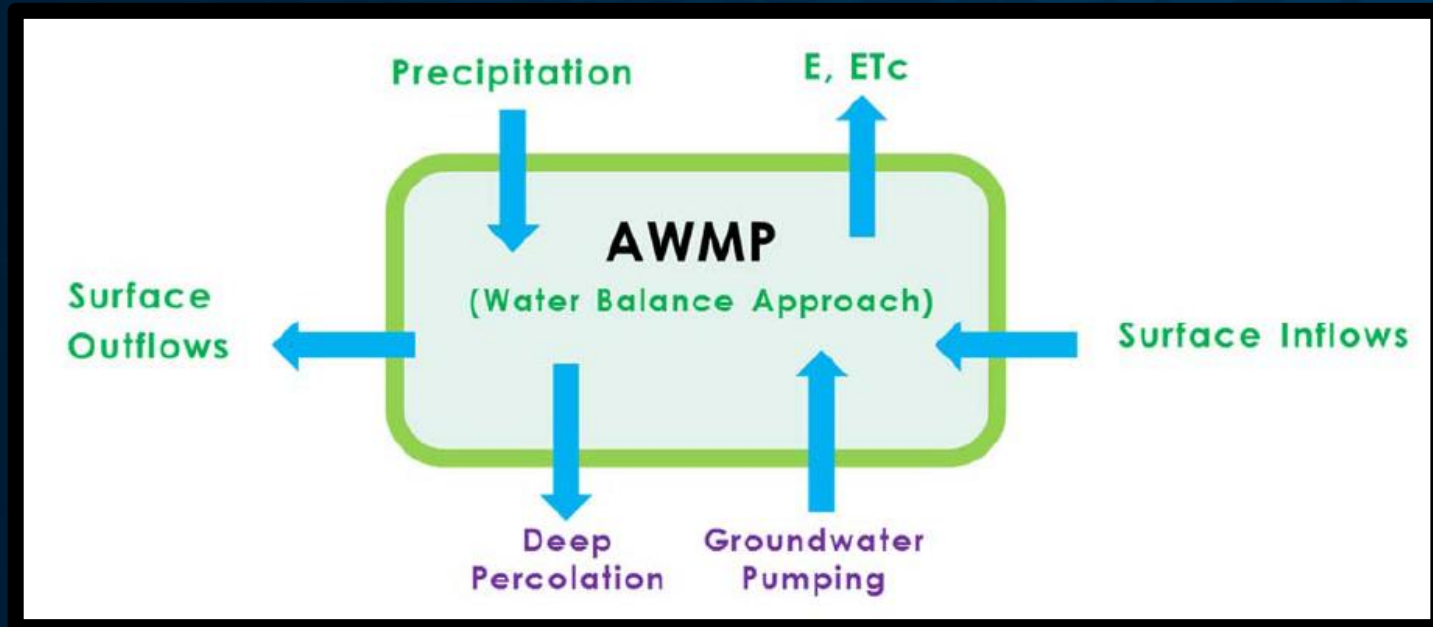
Peter Brostrom

Brostrom@water.ca.gov

916 / 651-7034

water.ca.gov/Programs/Water-Use-And-Efficiency

Water Conservation Ag Water Use



Water Conservation Urban Water Use

Indoor Residential



Outdoor Residential



CII Dedicated Irrigation Accounts



Distribution System Water Loss

Urban Water Use Objective

Water Conservation



CALIFORNIA DEPARTMENT OF WATER RESOURCES

Data-Driven Decision-Making

Open and Transparent Data

Chris McCready

Christina.McCready@water.ca.gov

916 / 651-9298

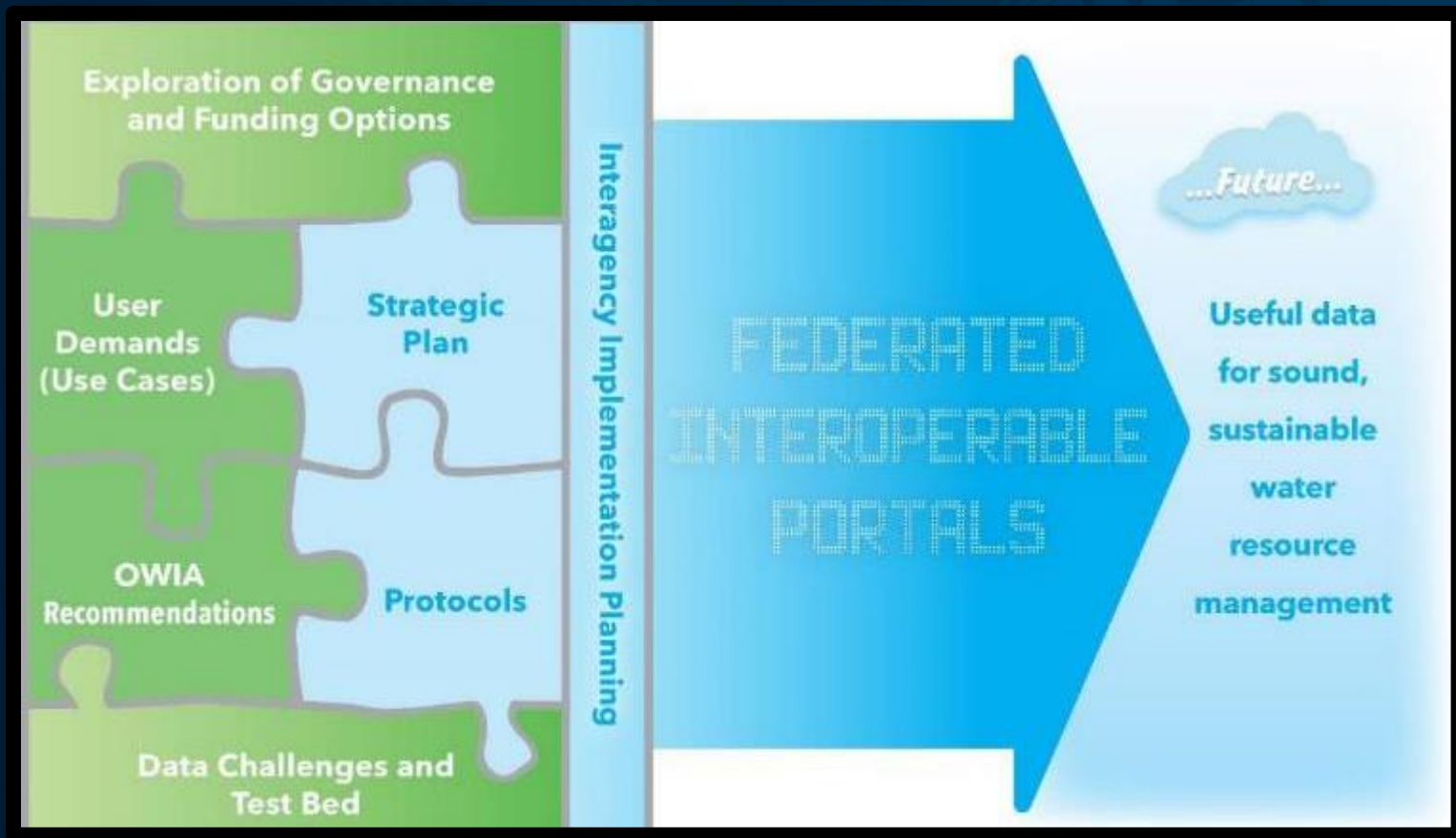
water.ca.gov/Programs/All-Programs/AB-1755

Open and Transparent Data

Key Components

- Open and Transparent Water Data Act (AB 1755, Dodd)
- DWR, CWQMC, SWRCB, CDFW
- State and federal datasets
- Platform and protocols
- Data integration, efficiency, access, usability
- Improved analysis across disciplines
- Foster innovation and scientific discovery
- Better-informed decisions and cost-effective investment

Open and Transparent Data Decision-Making





Questions?

California Water Plan Update 2018 Plenary

Wrap-up

Return tomorrow at 8:30 am